URECON
PRE-INSULATED PIPE

DETAILED SPECIFICATION

Polyethylene cased jacket
for above or below grade
Hi Temp system to 149°C (*300°F*)

1) General

This product is recommended for either above or below ground installations where the properties of a seamless PE jacket are desired for hot water applications.

It is critical that all field installed components of a Hi-Temp polyisocyanurate foam piping system be installed with special care and attention, ensuring that the system is not only insulated properly, but *completely waterproof* as well. Should moisture be trapped in the system by any means after commissioning, the moisture will flash off as steam, permanently damaging the insulation and jacketing.

Urecon's engineers shall review all pipe system layouts during the quoting stage to address expansion/contraction considerations, as well as system limitations. The pipe shall be insulated using the unique U.I.P.® two-fill factory insulation process, as supplied by Urecon, complete with integral conduit for electric heat trace cable *(if required).* Insulation of associated joints, fittings and accessories shall be as per Urecon's recommendations, depending on the size and type of pipe involved. All exposed ends of insulation shall be bagged with plastic or sealed with waterproof sealant prior to leaving the factory to prevent moisture ingress during shipping and storage. The product shall be manufactured in accordance to ISO 9001-2008 standards, or approved equal.

2) Pipe and casing preparation

Pipe and casing shall be cleaned of surface dust or dirt, if necessary, to insure adhesion of the foam to the pipe and casing surface. The pipe and/or polyethylene casing may be treated by sand blasting, application of a chemical foam-bonding compound, or by flame to enhance adhesion, as deemed necessary by Urecon and project requirements.

3) Insulation

a) Material: rigid polyisocyanurate foam, factory applied.
b) Thickness: 50 mm *(2 in)* or as required.
c) Density: (ASTM D 1622) 38,4 to 56 kg/m^3 *(2.4 to 3.5 lbs/ft^3).*
d) Closed cell content: (ASTM D 6226) 90%, minimum.
e) Water absorption: (ASTM C 272) 4.0% by volume.
f) Thermal conductivity: (ASTM C518) 0,020 to 0,026 W/m ^{0}C *(0.14 to 0.17 Btu • in/ft^2 •hr •^{0}F).*

4) System properties

a) System compressive strength: (modified ASTM D 1621 with casing jacket) approximately 690 to 1379 kPa *(100-200 lbs/in^2),* varies with pipe diameter.

b) Pipe service temperature range: from -45^o to 149^{0}C *(-49^0 to 300^{o}F)*; the overall factory insulated system limitations are dependant on core pipe type and application. Call your Urecon representative for details.

5) Outer PE jacket

The outer protective jacket on the casing system shall consist of black P.E., UV inhibited, factory applied as per the following specifications:

a) Cell classification =234360C for PE, ASTM D3350

b) Minimum 2% carbon black, well dispersed

c.) Minimum recommended PE casing jacket thicknesses (for above grade applications)-

Jacket OD	<or = 300mm (*12"*)	@ 3,17 mm (*125 mil*)
Jacket OD 300mm (*12"*) to	< or = 600mm (*24"*)	@ 3,81 mm (*150 mil*)
Jacket OD	> 600mm (*24"*)	@ 4,44mm (*175 mil*)

*other jacket thicknesses are available upon request

6) Joints for PE cased system

a) Insulated pipe joints (above ground)

Insulated pipe joints shall consist of prefabricated rigid polyisocyanurate foam half shells supplied complete with either:

- Urecon Sealed Slipjoint® consist of Canusa SuperSeal heat shrink wrap complete with closure seal primary seal complete with 3,17 – 4,41mm *(0.125 to 0.175 in.)* wall split PE casing, stainless steel bands and band-it clips outer jacket. This outer PE jacket prtotects the sealed shrink wrap from the damaging effects of the sun's UV rays, and allows for expansion and contraction by having one end fixed while the other end is free to slide.
- For more demanding applications, a heat-shrinkable expanded cross linked polyethylene casing is available; this is the Urecon Mec-Seal® joint kit. Refer to Urecon's Mec-Seal® submittal data sheet for details.

b) Insulated pipe joints (buried)

Insulated pipe joints shall consist of field foamed in place Hi-Temp polyisocyanurate foam supplied complete with Canusa SuperSeal heat shrink wrap with closure seal, as supplied by Urecon. The heat-shrink sleeves shall overlap the insulation jacket by a minimum of 75 mm *(3 in)* on either side of the joint. For more demanding applications, a Urecon Mec-Seal® joint kit should be considered; refer to the Mec-Seal® submittal data sheet for details.

7) Insulation kits for fittings

a.) Insulation-

Insulation for fittings shall consist of rigid polyisocyanurate foam half shells or polisocyanurate 'foamed in place' insulation (for below grade) with the following characteristics-

.1 Density (ASTM D1622) 27 to 32 kg/m^3 *(1.7 to 2.0 lbs/ft^3).*
.2 Compressive strength (ASTM D1621) 131 to 158 kPa *(19 to 23 lbs/in^2)* .
.3 Closed cell content (ASTM D 6226) 90%, minimum.
.4 Water absorption: (ASTM C 272) 4.0% by volume.
.5 Thermal conductivity: (ASTM C 518) 0,027 W/m^{0}C, (*0.19 Btu • in/ft^2 • hr • ^{0}F*).
.6 Thickness, to match pipe insulation thickness.

b.) Jacket for fittings-

i-Field applied-

The insulation shall be waterproofed with 100 mm (*4 in*) wide Canusa Wrapid® heat shrink tape spiraled around the entire fitting allowing a 50% overlap onto itself and shall extend onto the adjacent insulated pipe jacketing a minimum of 75 mm (*3 in*); Canusa SuperSeal heat shrink wrap with closure seal may be used for below grade on the straight sections, Urecon 'Sealed SlipJoint' as described above in Section 6a for above ground.

ii-Factory insulated-

Urecon recommends that all fittings be factory insulated and fitted with extension legs. PE casing as per Section 5c above shall be mitred / fused around the fitting to form a robust waterproof assembly. The annular space shall then be filled with polyisocyanurate insulation as per Section 7a above.

Expansion/contraction pads shall be installed as per specifications; consult Urecon for design assistance if required.

8.) End Seals–

Canusa® PLX-65 heat shinkable end seals shall be field installed at all pipe insulation exposed ends at thrust blocks, building entries, etc.

9.) Anchor point assembly-

Shall be supplied by Urecon and shall be 'foamed in place' as described above, then double sealed against moisture ingress using Canusa SuperSeal heat shrink wrap for the inner layer and Canusa WLOX® high ratio heat shrink wrap for the outer seal. Concrete shall then be poured as per specification. Refer to the anchor point assembly schematic detail for more information.

Note: -Physical characteristics are nominal and may vary depending on pipe type and diameter. (Revised Jan. 2012)